Claimed is:

1. An assembly comprising a filter and pellet for late inoculation of cast irons in their final filtration wherein said pellet is obtained by agglomeration of a powdered inoculant alloy and said filter is a refractory porous material, wherein said powdered inoculant of said pellet comprises a particle size distribution comprising 100%, by weight, less than 2 mm; 30-70%, by weight, between 50-250 μ, and less than 25%, by weight, below 50 μ and said filter only allows particles below 10 μ to pass there through.

2. The assembly of claim 1 wherein said filter only allows particles below 3 μ to pass there through.

3. The assembly of claim 1 wherein said pellet has a mass, measured in grams, and said filter has a surface area, measured in cm^2, and a ratio of said grams to said surface area is at least 0.75 to no more than 1.5.

4. The assembly of claim 1 wherein said assembly treats a molten cast iron flow rate of at least 1 kg/s to no more than 25 kg/s.

5. The assembly of claim 1 wherein said pellet has an inoculant alloy powder comprising between 40% and 60%, by weight, said between 50-250μ and less than 20%, by weight, below said fraction below 50 μ.

6. The assembly of claim 1 wherein said powdered inoculant comprises a blend of two or more inoculant powder alloys.

7. The assembly of claim 1 wherein said powdered inoculant is a blend of two or more products constituting a heterogenous inoculant.

8. The assembly of claim 1 wherein said pellet comprises an active component comprising about 40-99.9%, by weight carrier comprising ferrosilicon and about 0.1-60%, by weight, and at least one inoculating agent selected from rare earths.

9. The assembly of claim 1 wherein said pellet comprises an active component comprising about 40-99.9%, by weight carrier comprising ferrosilicon and about 0.1-60%, by weight, and at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur.

10. The assembly of claim 9 wherein said pellet comprises at least one inoculating element selected from a group consisting of strontium, zirconium, calcium, lanthanum, manganese and aluminum.

11. The assembly of claim 9 wherein said pellet comprises about 0.1-40%, by weight, inoculating element.

12. The method for inoculating molten iron of claim 11 wherein said pellet comprises about 0.1-20%, by weight, inoculating element.

13. The assembly of claim 1 wherein said pellet has an inoculant dissolution rate of at least 1 mg/sec. to no more than 320 mg/sec.

14. The assembly of claim 13 wherein said pellet has an inoculant dissolution rate of at least 10 mg/sec.

15. The assembly of claim 14 wherein said pellet has an inoculant dissolution rate of at least 20 mg/sec.

16. The assembly of claim 13 wherein said pellet has an inoculant dissolution rate of no more than 250 mg/sec.

17. The assembly of claim 16 wherein said pellet has an inoculant dissolution rate of no more than 200 mg/sec.

18. A method for inoculating molten iron comprising passing said molten iron through a filter assembly at an approach velocity of about 1 to about 60 cm/sec. wherein said filter assembly comprises a filter element and an inoculation pellet in contact with said filter element wherein said pellet has an inoculant dissolution rate of at least 1 mg/sec. to no more than 320 mg/sec.

19. The method for inoculating molten iron of claim 18 wherein said inoculant dissolution rate is at least 10 mg/sec.

20. The method for inoculating molten iron of claim 19 wherein said inoculant dissolution rate is at least 20 mg/sec.

21. The method for inoculating molten iron of claim 18 wherein said inoculation pellet comprises an active component comprising about 40-99.9%, by weight carrier comprising ferrosilicon and about 0.1-60%, by weight, at least one inoculating agent selected from rare earths.

22. The method for inoculating molten iron of claim 18 wherein said inoculation pellet comprises an active component comprising about 40-99.9%, by weight carrier

comprising ferrosilicon and about 0.1-60%, by weight, at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur.

23. The method for inoculating molten iron of claim 22 wherein said pellet comprises at least one inoculating element selected from a group consisting of strontium, zirconium calcium, aluminum, lanthanum and manganese.

24. The method for inoculating molten iron of claim 18 wherein said pellet has an inoculant dissolution rate of at least 2 mg/sec.

25. The method for inoculating molten iron of claim 21 wherein said pellet has an inoculant dissolution rate of at least 2 mg/sec.

26. The method for inoculating molten iron of claim 18 wherein said pellet has an inoculant dissolution rate of no more than 250 mg/sec.

27. The method for inoculating molten iron of claim 26 wherein said pellet has an inoculant dissolution rate of no more than 200 mg/sec.

28. The method for inoculating molten iron of claim 18 wherein said approach velocity is about 1 to about 40 cm/sec.

29. The method for inoculating molten iron of claim 28 wherein said approach velocity is about 10 to about 30 cm/sec.

30. The method for inoculating molten iron of claim 18 wherein said approach velocity is about 15 to about 25 cm/sec. and said inoculant dissolution rate is at least about 2 to no more than about 250 mg/sec.

31. The method for inoculating molten iron of claim 18 wherein said pellet comprises about 0.1-40%, by weight, inoculating element.

32. The method for inoculating molten iron of claim 31 wherein said pellet comprises about 0.1-20%, by weight, inoculating element.

33. The method for inoculating iron of claim 18 wherein said pellet comprises an agglomerated powder inoculant pellet comprising a particle size distribution comprising 100%, by weight, less than 2 mm; 30-70%, by weight, between 50-250 μ, and less than 25%, by weight, below 50 μ and said filter only allows particles below 10 μ to pass there through.

34. The method for inoculating iron of claim 33 wherein said pellet has an agglomerated powder inoculating pellet comprising between 40% and 60%, by weight, particles between 50-250 μ, and less than 20% by weight below 50 μ.

35. The method for inoculating iron of claim 33 wherein said filter only allows particles below 3 μ to pass therethrough.

36. The method for inoculating iron of claim 18 wherein said pellet has a mass, measured in grams, and said filter has a surface area, measured in cm^2, and a ratio of said mass to said surface area is at least 0.75 to no more than 1.5.

37. The method for inoculating iron of claim 18 wherein said filter assembly treats a molten cast iron flow rate of at least 1 kg/s to no more than 25 kg/s.

38. A filter assembly comprising a porous filter and an inoculant pellet wherein said inoculant pellet comprises a carrier and inoculant wherein:
said carrier comprises at least 30%, by weight ferrosilicon; and
said inoculant comprises at least one inoculating agent selected from rare earths.

39. A filter assembly comprising a porous filter and an inoculant pellet wherein said inoculant pellet comprises a carrier and inoculant wherein:
said carrier comprises at least 30%, by weight ferrosilicon; and
said inoculant comprises at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur.

40. The filter assembly of claim 39 wherein said filter only passes particles below 10 μ in size.

41. The filter assembly of claim 39 wherein said pellet has a mass, measured in grams, and said filter has a surface area, measured in cm^2, and a ratio of said mass to said surface area is at least 0.75 to no more than 1.5.

42. The filter assembly of claim 39 wherein said pellet comprises about 40-99.9%, by weight, said carrier and about 0.1-60%, by weight said inoculant.

43. The filter assembly of claim 42 wherein said pellet comprises about 0.1-20%, by weight said inoculant.

44. The filter assembly of claim 39 wherein said inoculant comprises at least one inoculating agent selected from a group consisting of strontium, zirconium, aluminum, calcium, manganese and lanthanum.

45. A method for inoculating molten iron comprising the steps of:

passing said molten iron through a filter assembly at a rate of about 1-60 cm/sec. wherein said filter assembly comprises a filter element and an inoculation pellet in contact with said filter element wherein said inoculant pellet comprises a carrier and about 0.1-60%, by weight, inoculant comprising at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur wherein said pellet has an inoculant dissolution rate of at least about 1 mg/sec. to no more than about 320 mg/sec. thereby forming inoculated molten iron; and

collecting said inoculating molten iron.

46. The method for inoculating molten iron of claim 45 wherein said inoculating agent is selected from a group consisting of strontium, calcium, aluminum, zirconium, lanthanum and manganese.

47. The method for inoculating molten iron of claim 45 wherein said pellet has an inoculant dissolution rate of at least about 2 to about 250 mg/sec.

48. The method for inoculating molten iron of claim 45 wherein said pellet has an inoculant dissolution rate of at least about 2 to about 250 mg/sec. measured with a 30.25 cm^2 cross-sectional flow.

49. The method for inoculating molten iron of claim 45 wherein said filter element comprises a central partial bore and said pellet is received in said central partial bore.

50. The method for inoculating molten iron of claim 45 wherein said carrier comprises at least 30%, by weight, ferrosilicon.

51. The method for inoculating molten iron of claim 45 wherein said pellet comprises about 0.1-20%, by weight, inoculant.

52. The method for inoculating iron of claim 45 wherein said pellet comprises agglomerated powder inoculant comprising a particle size distribution comprising 100%, by weight, less than 2 mm; 30-70%, by weight, between 50-250 μ, and less than 25%, by weight, below 50 μ and said filter only allows particles below 10 μ to pass there through.

53. The method for inoculating iron of claim 52 wherein said pellet has an inoculant alloy powder comprising between 40% and 60%, by weight, between 50-250 μ, and less than 20% by weight below 50 μ.

54. The method for inoculating iron of claim 52 wherein said filter only allows particles below 3 μ to pass there through.

55. The method for inoculating iron of claim 45 wherein said pellet has a mass, measured in grams, and said filter has a surface area, measured in cm^2, and a ratio of said mass to said surface area is at least 0.75 to no more than 1.5.

56. The method for inoculating iron of claim 45 wherein said filter assembly treats a molten cast iron flow rate of at least 1 kg/s to no more than 25 kg/s.

57. A process for molding iron comprising the steps of:

melting iron to form molten iron;

transporting said molten iron to a filter assembly wherein said filter assembly comprises a filter element and an inoculation pellet in contact with said filter element wherein said inoculant pellet comprises a carrier and about 0.1-60%, by weight, inoculant comprising at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur and wherein said pellet has an inoculant dissolution rate of at least about 1 mg/sec. to no more than about 320 mg/sec. measured at 30.25 cm^2 cross sectional flow area;

passing said molten iron through said filter assembly at a rate of about 1 to about 60 cm/sec. to form inoculated filtered iron;

transporting said inoculated filtered iron to a mold forming a molten shape; and

cooling said molten shape to form said molded iron.

58. The process for molding iron of claim 57 wherein said pellet has an inoculant dissolution rate of at least about 2 to about 250 mg/sec.

59. The process for molding iron of claim 57 wherein said filter element comprises a central partial bore and said pellet is received in said central partial bore.

60. The process for molding iron of claim 57 wherein said carrier comprises at least 30%, by weight, ferrosilicon.

61. The process for molding iron of claim 57 wherein said pellet comprises about 0.1-20%, by weight, inoculant.

62. A pellet for inoculating iron in a mold comprising about 40-99.9%, by weight, carrier and about 0.1-60%, by weight, inoculant wherein:

said carrier comprises at least about 30%, by weight, ferrosilicon;

said inoculant comprises at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur; and

said pellet has an inoculant dissolution rate of at least about 2 to about 250 mg/sec. measured at 15 cm/sec approach velocity with a 30.25 cm^2 iron flow.

63. A method for inoculating molten iron comprising passing said molten iron through a filter assembly at an approach velocity of about 1 to about 60 cm/sec. wherein said filter assembly comprises a filter element and an inoculation pellet in contact with said filter element wherein said pellet has an inoculant dissolution rate of at least 1 mg/sec. to no more than 320 mg/sec. and said inoculation pellet comprises an active component comprising about 40-99.9%, by weight, carrier comprising ferrosilicon and about 0.1-60%, by weight, at least one inoculating agent selected from a group consisting of cerium, strontium, zirconium, calcium, manganese, barium, bismuth, magnesium, titanium, aluminum, lanthanum and sulfur.